

REMARKS

Claims 1-8 have been cancelled. New Claims 9-31 have been added and are now active in this case.

REQUEST FOR RECONSIDERATION

Polycarbonate resin is used in a variety of applications due to the excellent optical and mechanical properties thereof. For some applications, such as DVDs, a surface-protecting film is used thereon. Unfortunately, many drawbacks exist with conventional surface-protecting films for polycarbonate such as curling and wrinkle deformation. Additionally, it has been difficult to obtain a satisfactory peel adhesive strength.

Advantageously, the present invention provides a surface-protecting film for polycarbonate which affords the following characteristics:

- 1) it is easily laminated with polycarbonate, avoids self-peeling, yet is easy to optionally remove from polycarbonate;
- 2) it has a 180° peel adhesive strength that is suppressed even after long term storage;
- 3) it exhibits no adhesive transfer to polycarbonate when it is laminated with polycarbonate.

In particular, the present invention provides a surface-protecting film containing a film substrate having a Young's modulus of 1 GPa or more, and a pressure-sensitive adhesive, the adhesive having a glass transition temperature (T_g) of between 40 to 90°C, and having an initial 180° peel adhesive strength (F_(CO)) to polycarbonate being between 10 to 300 mN/25mm.

Claims 1-8 stand rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Miyajima et al. '437 in view of Alahapperuma et al. '065.

However, neither reference, either alone or in combination, describes or suggests the present invention.

Notably, the pressure-sensitive adhesive (PSA) of Miyajima is a tacky type adhesive as may be seen from the PSA components and its T_g. For example, in examples 1 to 3 and 5 of Miyajima, 60 wt.% of butyl acrylate and 40 wt.% of ethyl acrylate were used to polymerize a PSA composition

in a solution. The Tg may be calculated to be about -40 °C from the Tg calculation equation (Fox equation). A small amount of isocyanate or epoxy compound will not change Tg in a significant way. Also, in example 4 of Miyajima, 60 wt.% of 2-ethylhexylacrylate, 30 wt.% of methyl acrylate, and 10 wt.% of vinyl acetate were used to polymerize a PSA composition in a solution. So its Tg can be calculated as being about -54 °C.

Moreover, that the PSA of Miyajima is a tacky type adhesive as may be seen from the ball tack described in table 1. Needless to say, ball tack adhesiveness can only be measured for tacky type adhesive. In other words, to obtain tackiness to the adhesive, the Tg of the PSA composition should be much lower than 0 °C.

Clearly, the Tg of the PSA composition of Miyajima is much lower than that of the present invention, such as from 40 to 90 °C. Hence, Miyajima teaches away from the present invention.

Also, the Examiner has opined out that shear modulus of the PSA composition in Miyajima is inherently the same as that of the present invention. This is respectfully deemed to be in error.

Notably, the shear modulus of a PSA composition is strongly related to Tg of the PSA composition, a fact which is widely recognized by one of ordinary skill in the art. In other words, both the shear modulus and Tg of the PSA composition in Miyajima is much lower than that of the present invention.

Further, the Examiner may have overlooked the fact that the present PSA is favorably made by energy-curing or heat-curing. Such PSA contains a polymer network and can show a higher Tg and shear modulus in comparison with a PSA obtained from solution polymerization.

Further, Miyajima clearly can not be combined with Alahapperuma. It is clear that Miyajima has disclosed a PSA sheet for polycarbonate. However, its peel adhesion can dramatically increase with irradiation of UV (wethermeter). Attached to this response is a Figure based on the data of example 2 described in Table 2. The evaluation of removability is good after 200 hours in irradiation time even though the peel adhesive strength becomes 850g/25mm. This indicates that strong curling of the polycarbonate film will occur judging from this adhesive strength.

To the contrary, the PSA of Alahapperuma is a radiation detackifiable adhesive composition. In other words, the initial adhesive strength value is considerable high, such as 225 to 430 g/25mm, and the adhesive strength after irradiation is very low.

So, it is quite clear that Miyajima, which increases adhesive strength by UV irradiation, and Alahapperuma, which decreases adhesive strength by UV irradiation, are fundamentally incompatible and can not be combined. With such inappropriate objectives, moreover, one skilled in the art would have no motivation to combine these references, and would be taught away from doing so.

Moreover, the present invention exhibits stable adhesive strength with time as shown in Fig. 6. In other words, an adhesive showing unstable performance such as that of Miyajima and Alahapperuma could not be used for the present invention. Hence, even the combined teachings of these references would not put one skilled in the art in possession of the present invention.

Furthermore, attention is directed to the Examples and Comparative Example of the present specification and the results thereof shown in Table 1 at page 37 of the specification.

Notably, by maintaining the Young's modulus, adhesive Tg and peel adhesive strength in accordance with the present invention, very good results are obtained in the "winding compaction test" at 20°C and 40°C, and the "adhesive transfer test" at 70°C. In contrast, when using a Young's modulus of < 1 GPa, or an adhesive Tg value < 40 or a peel adhesive strength of > 300, very poor results are obtained in the "winding compaction test" and "adhesive transfer test." Clearly, these results would not have been expected based upon the art of record.

Furthermore, it is quite clear that although Miyajima describes a PSA sheet for polycarbonate, the peel adhesion thereof dramatically increases with UV irradiation (wethermeter). As noted above, Figure 2 depicts the data of example 2 described in Table 2. Importantly, although the evaluation of removability is good after 200 hours in irradiation time, the peel adhesive strength becomes 850 g/25 mm. This will certainly lead to strong curling of the polycarbonate film; judging from such an adhesive strength.

Moreover, and perhaps most importantly, the present invention affords a stable adhesive strength over time as may be readily appreciated for Figure 6 of the present specification. This is a result that would not be expected by one skilled in the art from either Miyajima or Alahapperuma, either alone or in combination.

Hence, this ground of rejection is believed to be unsustainable and should be withdrawn.

Claims 2 and 8 stand rejected under 35 U.S.C. §112, second paragraph.

However, the term "F_(CO)" is defined as "initial 180" in Claim 1 and in the specification. Further, the term "F_(CRL)" is easily understood both from Figure 5 and page 17 of the present specification as the adhesive between the polycarbonate laminate and the releasing film.

Hence, this ground of rejection is deemed moot.

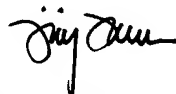
Accordingly, it is believed that the present application now stands in condition for allowance.

Early notice to this effect is earnestly solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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